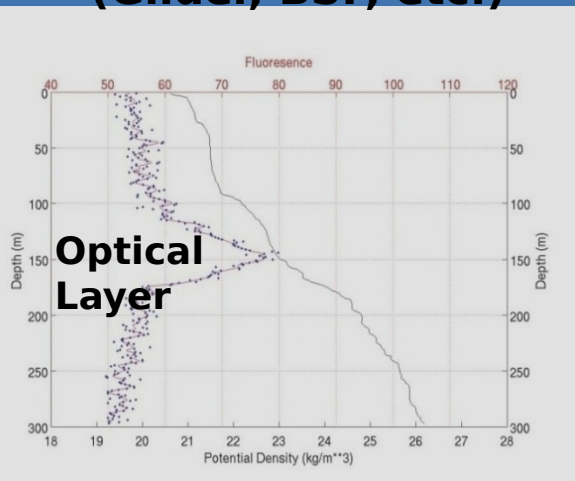


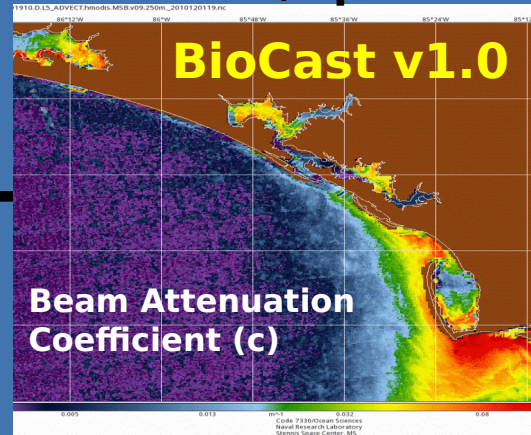
TODS Overview: Fusion of Glider Profiles, Satellite and Numerical Models to support AQS24 Operations

“Defining the optical environment for Navy Systems”

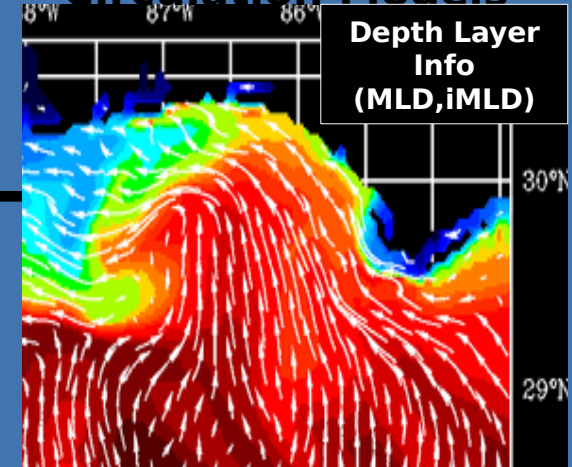
Vertical Optical Profiles (Glider, BSP, etc.)



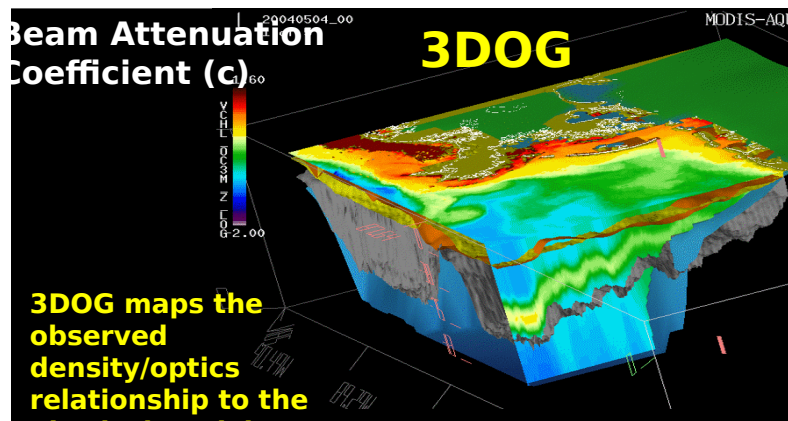
Nowcast / Forecast Satellite Optics BioCast/OpCast



Nowcast / Forecast Circulation Models



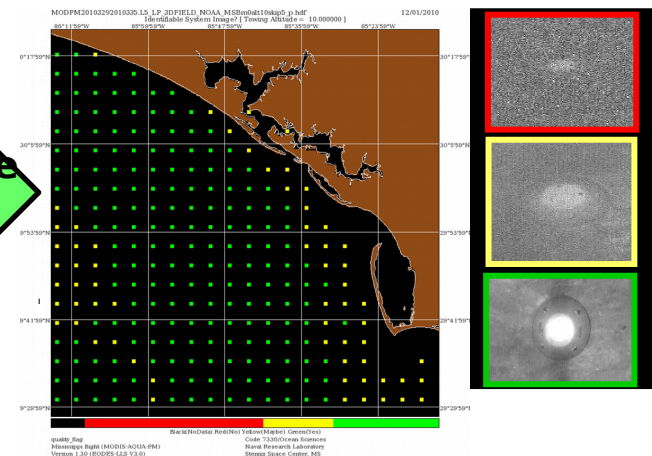
Optical Volume/Profiles & 3D Diver Visibility



AQS24 Performance Model (EODES)

Beam Attenuation
Coefficient (c)

Nowcast/Forecast Performance Surface Image Quality & Optimal System Towing Altitude



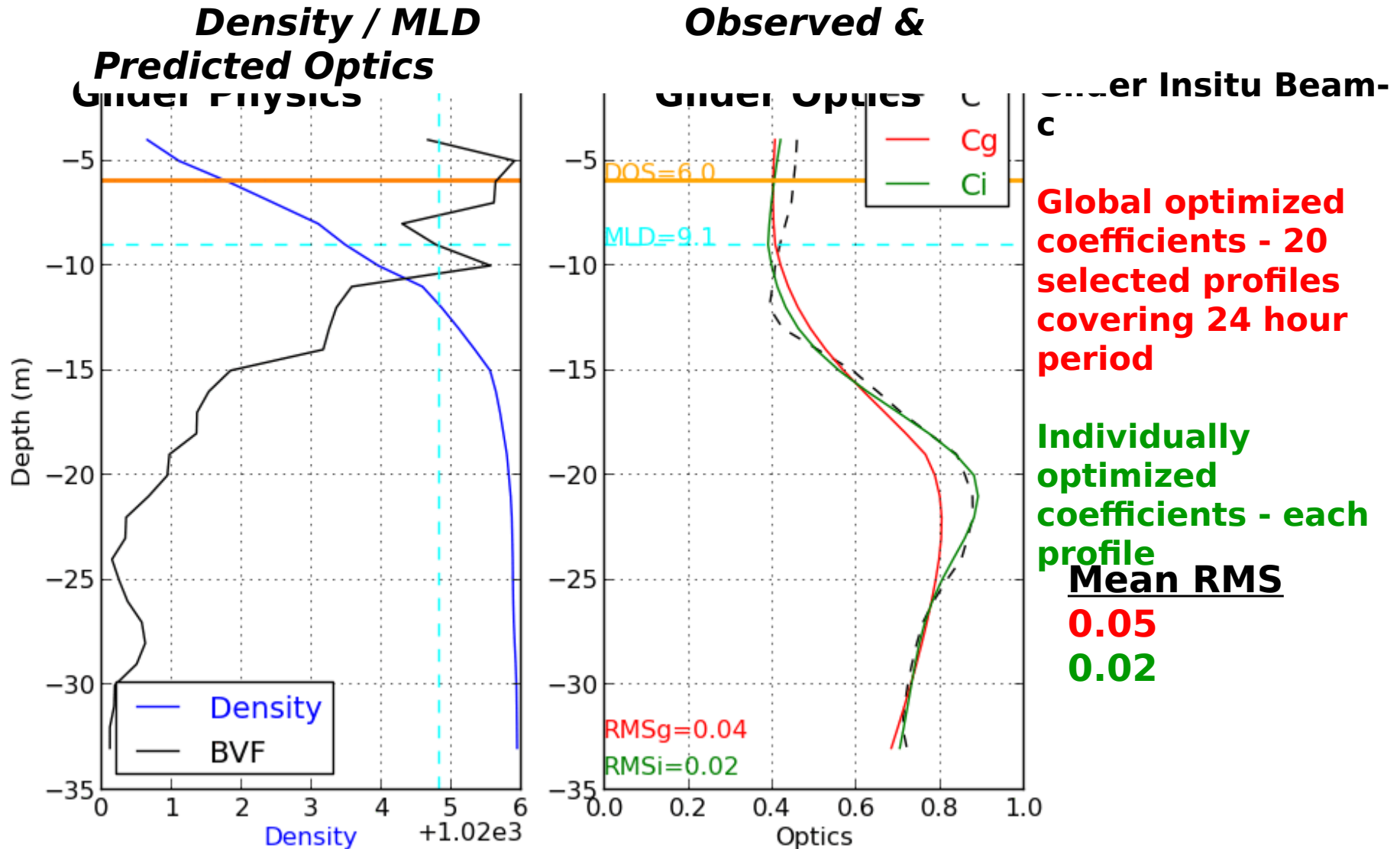
Insitu Physics/Optics Used to Tune Coeffs in 3DOG

3DOG Glider Optimization - Tuning Coefficients

Trident Warrior - July 17, 2013

3DOG Predicted Beam Attenuation 531nm Profiles

Defining Regional Optical/Physical Relationship

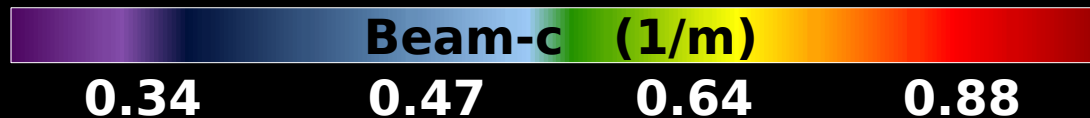
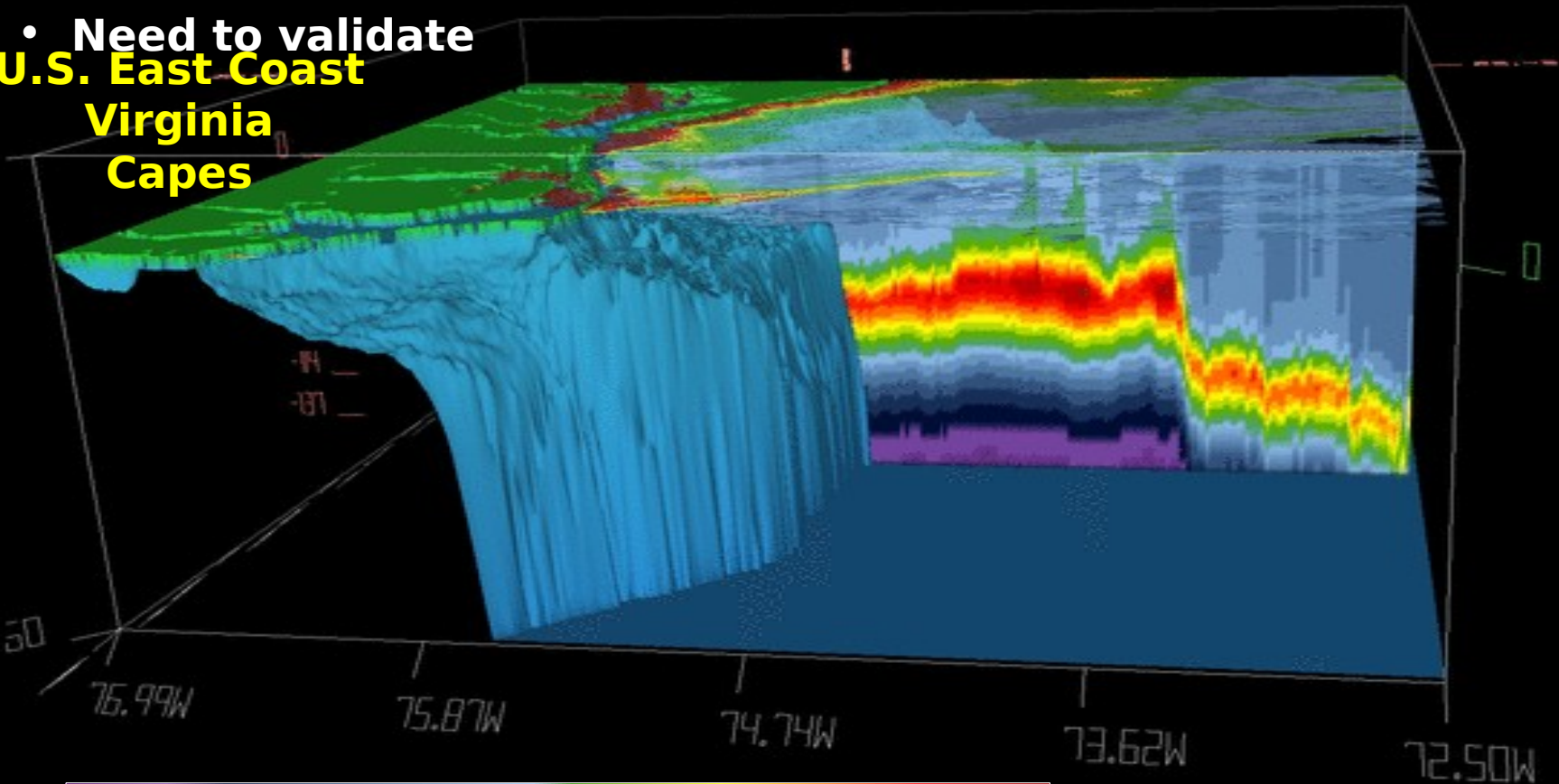


Trident Warrior 2013 July 17, 2013
3DOG Volume - Beam Attenuation 531nm

Preliminary Results Suggest:

- Coastal/shelf overturning, mixing, resuspension/sedimentation/nephloid layers
- Optical layers migrating up the shelf
- Interactions between surface features and subsurface
- Need to validate

U.S. East Coast
Virginia
Capes

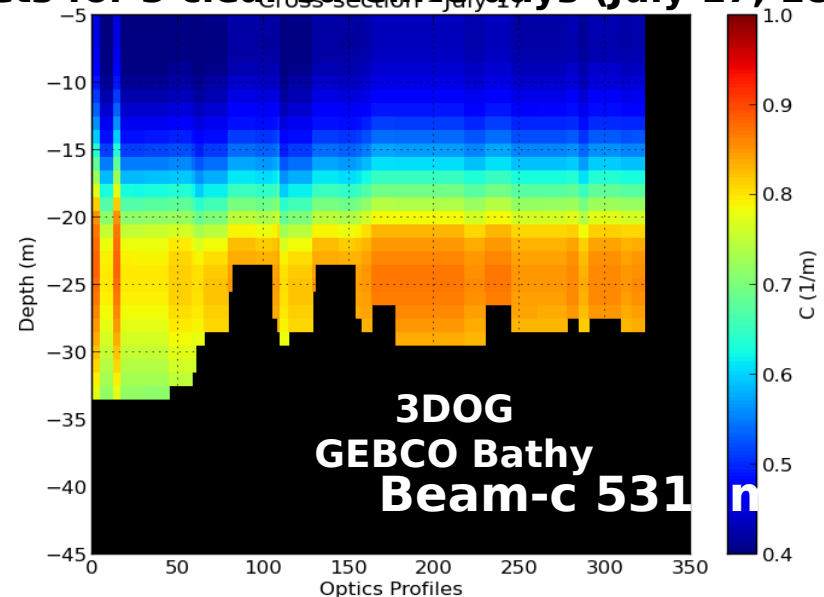
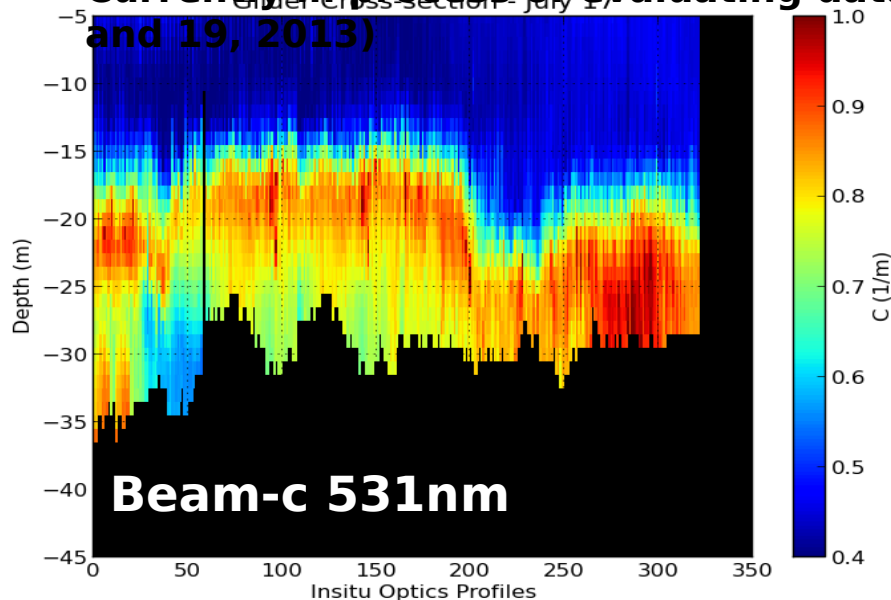


Bathymetry generated using
BatHygen / GEBCO database

3DOG Validation - Trident Warrior 13 - July 17, 2013

Preliminary Validation Results

- An optical (beam attenuation 531nm) layer is observed in glider profiles near bottom. Preliminary 3DOG results mimic the same optical layer.
- The relationship between the observed and modeled optical fields is dependent on the fidelity of the physical model to the observations.
- Differences between observed and predicted possibly due to model bathy (flat bottom) and vertical resolution (5-10m bins > 10m) not capturing fine scale details in observations, MLD selection and bottom turbulence/sediment resuspension.
- Observations span 24 hours whereas satellite and model are coincident/static (time of satellite overpass) in 3DOG.
- Currently in process of evaluating datasets for 3 clear satellite days (July 17, 18 and 19, 2013)





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GMT Hour

OPCAS

